

generally reported on the 10th in the central, northern, and western counties.—*Texas State Weather Service report.*

As compared with the preceding month the southern limit of frost in the south Atlantic states has extended from middle Georgia to southern Florida in about latitude $26^{\circ} 30'$; in Alabama it has extended from the central portion of the state to the Gulf coast; in Louisiana frost was reported to the extreme southern part of the state and was of frequent occurrence, whereas in October it was not noted south of the thirtieth parallel, and in the state, as a whole, it was reported for but a very limited number of dates; in Texas it was reported as far south as Rio Grande City, while in October the most southern station reporting frost was San Antonio.

In California frost occurred at Los Angeles on two dates, while at stations to the northward it was reported on from three to four dates.

LIMITS OF FREEZING WEATHER.

On chart vi are shown the southern and western limits of freezing weather during November, 1888. East of the Rocky Mountains the southern limit extends from the Mexican border (about lat. 29° , long. 104°) in a northeasterly direction to central Arkansas, thence southeasterly to southern Alabama, and from that locality northeasterly to the vicinity of Norfolk, Va., the distance from the coast from southern Alabama to Virginia generally ranging from sixty to one hun-

dred miles. The line indicating the western limit is traced along the immediate coasts of Washington Territory and Oregon to northern California, from which point it extends in an irregular southeasterly direction to southeastern Arizona, there being a gradual increase of distance from the coast line from northern California southward.

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature as observed at the harbors of the several stations; the monthly range of water temperature; and the mean temperature of the air for November, 1888:

| Stations. | Temperature at bottom. | | | | Mean temperature of air at the station. |
|------------------------|------------------------|------|--------|---------------|---|
| | Max. | Min. | Range. | Monthly mean. | |
| Canby, Fort, Wash..... | 54.2 | 45.0 | 9.2 | 49.7 | 47.4 |
| Cedar Keys, Fla..... | 77.0 | 56.0 | 21.0 | 67.3 | 61.8 |
| Charleston, S. C..... | 71.2 | 51.9 | 19.3 | 63.4 | 56.3 |
| Eastport, Me..... | 47.8 | 43.0 | 4.8 | 46.1 | 36.8 |
| Galveston, Tex..... | 75.8 | 53.9 | 21.9 | 64.8 | 60.6 |
| Key West, Fla..... | 81.7 | 72.3 | 9.4 | 77.6 | 74.7 |
| New York City..... | 53.0 | 41.7 | 11.3 | 49.1 | 45.2 |
| Pensacola, Fla..... | 74.5 | 62.0 | 12.5 | 68.7 | 58.2 |
| Portland, Oregon..... | 53.2 | 43.0 | 10.2 | 47.4 | 44.0 |

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for November, 1888, as determined from the reports of about one thousand stations, is exhibited on chart iv. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departure from the normal. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

Over the southwestern portions of the country from the Mississippi River westward to the Rocky Mountains, and in nearly all districts east of the Mississippi, the precipitation for November was above the normal. It was below the normal in the eastern Gulf states and over the northern portions of the country from the upper lake region westward to the Pacific. The excess over the average in Florida and in the districts along the southwestern border was unusually large, the precipitation ranging from two to three times the normal amount. In the west Gulf states about fifty per cent. more than the normal amount of rain fell, and in the south Atlantic states and New England the rainfall exceeded the average by from thirty to forty per cent. In the upper Mississippi and Ohio valleys the excess amounted to about twenty per cent. of the normal, and in the middle Atlantic states to about six per cent.

Less than half of the normal amount of rain fell in the extreme northwest and northern slope. In the middle slope it was about 60 per cent. of the normal; in the east Gulf states, 70 per cent.; upper lake region, 80 per cent.; and northern plateau, 90 per cent. On the north Pacific coast, where the heaviest rainfalls of the month occurred, the normal was not reached, there being a very slight deficiency in that district.

In California, where but little rain fell in October, the November normal has been exceeded by more than 50 per cent.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for a series of years; (2) the length of record during which the observations have been taken, and from which the average has

been computed; (3) the total precipitation for November, 1888; (4) the departure of the current month from the average; (5) and the extreme monthly precipitation for November during the period of observation and the years of occurrence:

| State and station. | County. | (1) Average for the month of Nov. | (2) Length of record. | (3) Total for Nov., 1888. | (4) Departure from average. | (5) Extreme monthly precipitation for November. | | | |
|-----------------------|-------------------|-----------------------------------|-----------------------|---------------------------|-----------------------------|---|-------|---------------|-------|
| | | | | | | Greatest. | | Least. | |
| | | | | | | Am't. | Year. | Am't. | Year. |
| <i>Arkansas.</i> | | <i>Inches</i> | <i>Years</i> | <i>Inches</i> | <i>Inches</i> | <i>Inches</i> | | <i>Inches</i> | |
| Lead Hill..... | Boone..... | 3.93 | 7 | 5.13 | +1.20 | 5.77 | 1883 | 2.50 | 1885 |
| <i>California.</i> | | | | | | | | | |
| Sacramento..... | Sacramento..... | 2.06 | 22 | 4.06 | +2.00 | 11.34 | 1885 | 0.00 | 1884 |
| <i>Colorado.</i> | | | | | | | | | |
| Fort Lyon..... | Bent..... | 0.36 | 12 | 0.14 | -0.22 | 1.50 | 1883 | 0.00 | 1870 |
| <i>Dakota.</i> | | | | | | | | | |
| Fort Randall..... | Todd..... | 0.59 | 21 | trace. | -0.59 | 1.50 | 1866 | 0.00 | 1875 |
| <i>Florida.</i> | | | | | | | | | |
| Merritt's Island..... | Brevard..... | 2.43 | 11 | 3.15 | +0.72 | 5.67 | 1884 | 0.17 | 1886 |
| <i>Georgia.</i> | | | | | | | | | |
| Forsyth..... | Monroe..... | 3.37 | 14 | 5.41 | +2.04 | 5.41 | 1888 | 1.01 | 1887 |
| <i>Illinois.</i> | | | | | | | | | |
| Peoria..... | Peoria..... | 2.32 | 33 | 2.67 | +0.35 | 4.93* | 1879 | 0.71* | 1875 |
| Riley..... | McHenry..... | 1.98 | 28 | 1.97 | -0.01 | 5.30* | 1879 | 0.72* | 1875 |
| <i>Indiana.</i> | | | | | | | | | |
| Logansport..... | Cass..... | 3.03 | 34 | 4.37 | +1.34 | 5.76† | 1881 | 1.43† | 1880 |
| <i>Iowa.</i> | | | | | | | | | |
| Vevay..... | Switzerland..... | 3.16 | 21 | 6.34 | +3.18 | 6.34 | 1888 | 0.37 | 1872 |
| <i>Kansas.</i> | | | | | | | | | |
| Cresco..... | Howard..... | 1.56 | 14 | 0.23 | -1.33 | 5.20 | 1879 | 0.18 | 1875 |
| Monticello..... | Jones..... | 2.32 | 35 | 2.77 | +0.45 | 5.29 | 1879 | 0.12 | 1865 |
| Logan..... | Harrison..... | 1.26 | 13 | trace. | -1.26 | 3.30 | 1882 | trace. | 1888 |
| <i>Louisiana.</i> | | | | | | | | | |
| Lawrence..... | Douglas..... | 1.92 | 13 | 4.54 | +2.62 | 5.15 | 1879 | 0.36 | 1875 |
| Wellington..... | Sumner..... | 0.97 | 9 | 1.28 | +0.31 | 1.98 | 1881 | 0.10 | 1886 |
| <i>Maine.</i> | | | | | | | | | |
| Baton Rouge..... | Baton Rouge..... | 5.09 | 24 | 1.91 | -3.18 | 9.75 | 1855 | 0.45 | 1864 |
| Grand Coteau..... | St. Landry..... | 3.67 | 6 | 2.36 | -1.31 | 5.71 | 1883 | 1.86 | 1887 |
| <i>Maryland.</i> | | | | | | | | | |
| Gardiner..... | Kennebec..... | 4.34 | 50 | 5.98 | +1.64 | 10.55 | 1845 | 1.14 | 1882 |
| <i>Massachusetts.</i> | | | | | | | | | |
| Cumberland..... | Allegany..... | 2.11 | 17 | 2.60 | +0.49 | 5.10 | 1877 | 0.82 | 1887 |
| <i>Michigan.</i> | | | | | | | | | |
| Bomerset..... | Bristol..... | 4.45 | 18 | 8.15 | +3.70 | 9.02 | 1876 | 1.45 | 1882 |
| Newburyport..... | Essex..... | 3.45 | 9 | 6.74 | +3.29 | 6.74 | 1888 | 0.97 | 1882 |
| Amherst..... | Hampshire..... | 3.56 | 14 | 4.50 | +0.94 | 5.65 | 1885 | 1.33 | 1882 |
| <i>Minnesota.</i> | | | | | | | | | |
| Thornville..... | Lapeer..... | 2.95 | 12 | 3.11 | +0.16 | 5.03 | 1881 | 1.42 | 1882 |
| Kalamazoo..... | Kalamazoo..... | 2.98 | 13 | 2.49 | -0.49 | 5.77 | 1877 | 1.24 | 1882 |
| <i>Mississippi.</i> | | | | | | | | | |
| Minneapolis..... | Hennepin..... | 1.25 | 13 | 0.45 | -0.80 | 2.48 | 1886 | 0.31 | 1878 |
| <i>Missouri.</i> | | | | | | | | | |
| Oregon..... | Holt..... | 3.07 | 6 | 2.75 | -0.32 | 7.81 | 1879 | 1.17 | 1878 |
| <i>Montana.</i> | | | | | | | | | |
| Fort Shaw..... | Lewis-Clarke..... | 0.44 | 18 | 0.03 | -0.41 | 0.84 | 1884 | 0.01 | 1877 |
| <i>New Hampshire.</i> | | | | | | | | | |
| Hanover..... | Grafton..... | 2.67 | 51 | 5.14 | +2.47 | 5.14 | 1888 | 0.59 | 1882 |

Deviations from average precipitation—Continued.

| State and station. | County. | (1) Average for the month of Nov. | (2) Length of record. | (3) Total for Nov., 1888. | (4) Departure from average. | (5) Extreme monthly precipitation for November. | | | |
|------------------------|---------------|-----------------------------------|-----------------------|---------------------------|-----------------------------|---|-------|----------------|-------|
| | | | | | | Greatest. | | Least. | |
| | | | | | | Am't. | Year. | Am't. | Year. |
| <i>New Jersey.</i> | | <i>Inches</i> | <i>Years</i> | <i>Inches</i> | <i>Inches.</i> | <i>Inches</i> | | <i>Inches.</i> | |
| South Orange | Essex | 3.20 | 14 | 4.85 | +1.65 | 6.62 | 1877 | 0.95 | 1883 |
| Moorestown | Burlington .. | 3.32 | 25 | 4.04 | +0.72 | 6.30 | 1877 | 1.28 | 1882 |
| <i>New York.</i> | | | | | | | | | |
| Palermo | Oswego | 3.40 | 14 | 3.45 | +0.05 | 5.75 | 1880 | 1.01 | 1882 |
| Cooperstown | Otsego | 3.06 | 34 | 3.09 | +0.03 | 5.38 | 1858 | 1.45 | 1876 |
| <i>Ohio.</i> | | | | | | | | | |
| Wauseon | Fulton | 3.10 | 16 | 4.06 | +0.96 | 5.83 | 1881 | 1.46 | 1884 |
| <i>Oregon.</i> | | | | | | | | | |
| Albany | Linn | 4.34 | 9 | 4.13 | -0.21 | 8.40 | 1885 | 1.73 | 1880 |
| Eola | Polk | 4.92 | 18 | 4.30 | -0.62 | 13.01 | 1877 | 1.45 | 1886 |
| <i>Pennsylvania.</i> | | | | | | | | | |
| Dyberry | Wayne | 3.17 | 18 | 4.61 | +1.44 | 7.10 | 1886 | 1.40 | 1882 |
| Grampian Hills .. | Clearfield .. | 2.99 | 18 | 3.66 | +0.67 | 6.03 | 1886 | 1.42 | 1872 |
| Wellsborough .. | Tioga | 4.00 | 9 | 3.68 | -0.32 | 6.61 | 1884 | 2.05 | 1885 |
| <i>South Carolina.</i> | | | | | | | | | |
| Statesburgh | Sumter | 1.87 | 8 | 1.76 | -0.11 | 3.90 | 1882 | 0.87 | 1886 |
| <i>Tennessee.</i> | | | | | | | | | |
| Milan | Gibson | 4.17 | 5 | 4.66 | +0.49 | 8.65 | 1886 | 1.61 | 1884 |
| Austin | Wilson | 3.97 | 13 | 6.61 | +2.64 | 7.24 | 1874 | 1.50 | 1887 |
| <i>Texas.</i> | | | | | | | | | |
| New Ulm | Austin | 5.10 | 16 | 5.34 | +0.24 | 14.93 | 1873 | 0.48 | 1887 |
| <i>Vermont.</i> | | | | | | | | | |
| Strafford | Orange | 3.37 | 14 | 6.20 | +2.83 | 6.20 | 1888 | 0.50 | 1874 |
| <i>Virginia.</i> | | | | | | | | | |
| Bird's Nest | Northampton | 2.22 | 19 | 3.60 | +1.38 | 6.75 | 1880 | 0.40 | 1879 |
| Wytheville | Wythe | 2.69 | 24 | 2.20 | -0.49 | 7.10 | 1877 | 0.44 | 1887 |
| <i>West Virginia.</i> | | | | | | | | | |
| Helvetia | Randolph .. | 3.78 | 11 | 2.97 | -0.81 | 7.98 | 1878 | 1.24 | 1887 |
| <i>Wisconsin.</i> | | | | | | | | | |
| Madison | Dane | 1.94 | 8 | 1.32 | -0.62 | 3.51 | 1874 | 0.40 | 1875 |

* For 13 years.

† For 9 years.

HAIL.

Hail is reported to have fallen as follows:

1st, Iowa, Minn., Mo.; 2d, Ark., Ill., Iowa, Mo.; 3d, N. Y.; 5th, Ill.; 6th, Colo.; 7th, Mo.; 8th, N. H.; 10th, Ariz., Ohio; 11th, Pa.; 12th, Ariz.; 13th, Tex.; 15th, Ga., Kans.; 16th, Ariz., Pa.; 17th, Nebr., N. Y.; 18th, Ind., Ohio; 22d, N. C.; 25th, Del., Md., Mass., N. H.; 26th, Cal., Me., Md., Mass., N. Y., Ohio, Pa., Vt., Va.; 27th, Ala., N. Y.; 28th, Ariz., N. Y.; 30th, Tex.

SLEET.

Sleet fell during November on the several dates as follows:

1st, Mont.; 5th, Dak.; 6th, Colo.; 7th, Mo.; 8th, Kans., Mo., N. Y.; 9th, Iowa, Kans.; 10th, Mich., Wis.; 11th, Conn., N. Y., Pa., Vt.; 12th, Vt.; 15th, Ill., Kans., Nebr.; 16th, Ill., Mo., N. Y., Pa., Vt.; 17th, Ark., Colo., Mo., N. Y.; 18th, Ill., Mo., N. Y., Ohio, W. Va.; 19th, Mich., Ohio; 23d, Ga.; 24th, Conn.; 25th, Conn., Me., N. H., N. J., Ill., Pa.; 26th, Conn., Me., Md., N. J., N. Y., Pa., Vt.; 27th, Ala., Me., N. Y., Ohio, W. Va.; 23th, Dak., Mich., Minn., Wis.; 29th, Ill., Iowa, N. Y., Ohio; 30th, Ark., Ill., Kans., Mich., Mo., N. Y., Ohio, W. Va., Wis.

SNOW.

On every day during the month snow occurred in some part of the United States. It fell over the greatest extent of territory between the 15th and 18th, and from the 25th to the end of the month. The periods during which snow was reported from the least number of stations are: 1st-3d, 11-13th, and 19th-23d. In Colorado, Dakota, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Vermont snow fell on from ten to sixteen dates. Eastward of the Mississippi River the most southerly latitude in which snow fell was N. 37°, 27th.

MONTHLY SNOWFALLS (inches and tenths) IN NOVEMBER.

It may be stated that in general the snowfalls of November were remarkably small. The greatest of the month occurred over the central and southern Rocky Mountain slopes, in the central portions of the Missouri Valley, the northern portion of the upper lake region, and in northern New England, where numerous stations report depths ranging from eight to ten inches. Southward of the fortieth parallel to the eastward of the Mississippi River the heaviest snowfalls occurred in West Virginia, where, in some portions of the state, as much as seven

inches fell. No appreciable amount of snow fell to the southward of the thirty-seventh parallel to the eastward of the ninety-fifth meridian, and, with the exception of the southern Rocky Mountain slope, none fell to the south of that parallel to the westward of the meridian named. Along the immediate Atlantic coast from Rhode Island, southward the snowfall of the month was inappreciable. Over much the greater part of the northern districts of the country the total snowfall did not reach three inches, and over extensive areas in the central valleys and lake region it was of such a character that no measurable quantities were reported. Below are given all monthly snowfalls of three inches, or more, and in states and territories where the maximum depth was below that amount, the station reporting the greatest is given:

Arizona.—Flagstaff, 3. *Arkansas.*—Lead Hill, trace. *Colorado.*—Leadville, 9; Monte Vista, 6; Ranch near Como, 5.5; T. S. Ranch, 5.2; Greeley, 4.8; Georgetown, 4.5; Delta, 4; Denver, 3. *Connecticut.*—New Hartford, 5; Canton, Mansfield, Middletown, and Wallingford, 4; New Haven, 3. *Dakota.*—Parkston and Rapid City, 5; Fort Pembina, 3.5. *Delaware.*—Viola, 1. *District of Columbia.*—Washington City, 1.5. *Idaho.*—Boisé City, 1.6. *Illinois.*—Martinsville and Vandalia, 5; Flora and Philo, 3. *Indiana.*—Worthington, 3. *Indian Territory.*—Fort Reno, 2. *Iowa.*—Osceola, 11; Grinnell, 3. *Kansas.*—Globe, 18; Elko, 13; Lawrence, 12; Augusta, 10; Leavenworth, 9.9; Topeka, 9.8; Wichita, 9; Havensville, 8; Yates Centre, 7.5; Lebo, 6.5; Rome, 6; Wakefield, 5.2; Morse, 4.5; Waterville, 4; Cunningham, 3.5; Elk Falls and Fort Leavenworth, 3. *Kentucky.*—Ashland and Millersburg, 3. *Maine.*—Orono and Belfast, 10; Bar Harbor, 9.5; Cornish, 9.2; Kent's Hill, 8.5; Gardiner, 7.8; Mayfield, 7; Lewiston, 6; Portland, 5.5; Eastport, 5; Calais and Fort Preble, 4. *Maryland.*—Fallston, 5; Mount Saint Mary's, 3. *Massachusetts.*—Mansfield, 15; Rowe, 10; Blue Hill Observatory, Newburyport, and Northampton, 9; Beverly Farms, 8; Newburyport, 6.2; Chestnut Hill, Gilbertville, and Lawrence, 6; Amherst, Fitchburg, Ludlow, Somerset, and Springfield, 5; Boston, 4.8; Mount Nonotuck, 4; Holyoke, 3.9; Dudley and Milton, 3.5; Fall River, Fiskdale, and Leominster, 3. *Michigan.*—Fort Brady, 15.5; Sault de St. Marie, 11.8; Marquette, 8.4; Gaylord, 8; Hillman, 6; Alpena, 5.5; Mottville, 5; Calumet, 4.5; Lausling, 3.6; Alma, Deer Lake, Fletcher, and West Branch, 3. *Minnesota.*—Saint Vincent, 2.6. *Missouri.*—Conception, 7. *Montana.*—Helena, 5; Fort Custer, 4.5; Fort Keogh, 4. *Nebraska.*—Fort Robinson and Hay Springs, 3. *Nevada.*—Wellington, 12.5; Eureka, 4.3; Austin, 3. *New Hampshire.*—Berlin Falls and Berlin Mills, 10; Walpole, 8; Antrim and West Milan, 7; Chesterfield, 6; Concord, Manchester, and Nashua, 5; Hanover and Plymouth, 4; Shaker Village and Stratford, 3. *New Jersey.*—Egg Harbor City, 1. *New Mexico.*—Fort Stanton, 10.5; Santa Fé, 7.7. *New York.*—Albany, 9.5; Constableville and Middleburgh, 9; Canton, 8.6; Ilion, 7.6; Barnes' Corners, 7.2; Johnstown and Wedgewood, 7; Auburn and Humphrey, 6; Lyons and White Plains, 5; Queensbury, 4.9; Rose, 4.5; Boyd's Corners, Carmel, Cooperstown, Ithaca, Penn Yan, Rochester, and South Canisteo, 4; Perry City and Plattsburgh Barracks, 3.5; Ardenia, Geneva, and Savona, 3. *Ohio.*—Cleveland, 5.3; College Hill, Lordstown, and New Athens, 3. *Pennsylvania.*—Wellsborough, 6.6; Eagle's Mere, 4.8; Grampian Hills, 4; Salem Corners and Pittsburgh, 3. *Rhode Island.*—Pawtucket, 6; Lonsdale, 5; Providence a and Woonsocket, 4; Kingston and Providence b, 3. *Tennessee.*—Rogersville and Springdale, trace. *Texas.*—Decatur and Fort Davis, 1. *Utah.*—Salt Lake City, 1. *Vermont.*—Jacksonville, 11; Coventry, 9.8; Strafford, 9; Brattleborough and East Berkshire, 8; Chelsea, 7; Manchester, 4.5; Burlington and Lunenburg, 4; Northfield and Vernon, 3. *Virginia.*—Spottsville, 1. *Washington Territory.*—Spokane Falls, 0.3. *West Virginia.*—Middlebrook, 7; Hartmansville and Helvetia, 4; Tyler Creek, 3. *Wisconsin.*—Green Bay, 1.2. *Wyoming.*—Fort Washakie, 8; Cheyenne, 6.8; Fort Laramie, 6.

DEPTH OF SNOW REMAINING ON GROUND AT 15th AND CLOSE OF EACH MONTH.

With a view of publishing in the MONTHLY WEATHER REVIEW charts showing the depths of snow remaining on the ground at the 15th and end of the month the following letter was sent by the Chief Signal Officer to all co-operating observers between October 13th and 16th, 1888:

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, November, 15, 1888.

SIR: The Chief Signal Officer desires, in connection with the growth of winter wheat, etc., to publish with the MONTHLY WEATHER REVIEW of the Signal Service, for the benefit of those interested in agriculture, charts exhibiting the portions of country covered by snow on the 15th and at the close of the month, the region within which snow has fallen during the month in such quantity as to cover the ground more than temporarily, and the southern limit of freezing weather. With this end in view the voluntary and all co-operating observers are especially requested to enter upon their monthly forms the amount of snow, if any, remaining on the ground on the 15th and last day of each month from October to April, inclusive, and to add such notes as may be pertinent in connection with the beneficial or injurious effects of snow and frost on agricultural interests.

The reports furnished in compliance with the above request have been examined and show that with the exception of a few localities of limited extent there was practically no snow on the ground in any part of the United States on the 15th, therefore the chart contemplated for that date is omitted.

The amount of snow remaining on the ground at the end of the month is indicated on chart vi, from which it will be seen that, comparatively, but a small portion of the country was covered, and that, in general, the depths were below two inches. The one inch line extends from the upper lake region southward to the upper Ohio valley and thence northeastward, at some distance inland from the coast, to northern New England. Northward of the one inch line there are several small areas over which the depth of snow amounted to two inches or more, and in northern New Hampshire there is a small area over which there was more than 4 inches. In portions of Montana, Colorado, and New Mexico there are limited areas over which snow remained at the close of the month in depths ranging from 4 inches to inappreciable quantities.

EXCESSIVE PRECIPITATION.

From the accompanying table it will be seen that during the month of November very few rainfalls of ten inches, or more, have occurred in any part of the United States, with the exception of the Pacific coast northward of the thirty-seventh parallel. It appears from the records of the past five years that some portions of the immediate coast of Washington Territory are more frequently subjected to rainfalls in excess of ten inches than smaller amounts. This is true of both Tatoosh Island and Neah Bay, the records of the former station showing that in but one year since 1883 has the November rainfall been less than ten inches, viz., in 1884, when it was nearly seven inches. The normal rainfall for both Tatoosh Island and Neah Bay exceeds twelve inches. In northern California the rainfall during November in both 1875 and 1885 was remarkably heavy, especially in the latter year, when stations reporting amounts ranging from ten to twenty-nine inches were numerous. East of the Rocky Mountains the largest November rainfalls recorded are the following: Fort Barrancas, Fla., 17.79 in 1878; Point Pleasant, La., 20.89 in 1877, and 19.52 in 1880; Mount Washington, N. H., 17.55 in 1877, and 15.10 in 1881.

Daily rainfalls, reaching, or exceeding, two and one-half inches during November, while of uncommon occurrence, have been reported most numerous in the region extending from the central Mississippi, lower Missouri, and Ohio valleys southward to the Gulf, and along the Atlantic coast. None have occurred in the extreme Northwest and very few in the lake region. Notwithstanding the very large monthly rainfalls that occur on the north Pacific coast in November but few daily falls have reached two and one-half inches, a fact due to the steady and persistent character of the rains in that region at this season, which, while giving enormously heavy monthly

falls, rarely exceed two and a half inches for twenty-four consecutive hours. The following are some of the greatest daily rainfalls shown by the records: Fort Barrancas, Fla., 10.39, 26th, 1878, and 6.07, 16th, 1881; Mattoon, Ill., 5.11, 26th, 1877; Vandalia, Ill., 5.00, 26th, 1887; New Orleans, La., 5.20, 9th, 1879; Point Pleasant, La., 6.80, 8th, and 7.10, 20th, 1877; Ellsworth, N. C., 5.00, 28th, 1880; Wellsborough, Pa., 5.50, 23d, 1884; Belmont Farm, Tex., 7.00, 1st, 1877; Galveston, Tex., 5.63, 6th, 1872; Palestine, Tex., 5.05, 10th, 1883.

The records for all regular and voluntary stations of the Signal Service during the entire period covered by the observations show but thirty-two instances in which rainfalls of one inch or more per hour have occurred in the United States during November, and two of these occurred at Los Angeles, Cal., the others occurred to the eastward of the one-hundredth meridian and were for the most part confined to the Southern States. At Galveston and San Antonio, Tex., Vicksburg, Miss., and Columbus, Ohio, hourly rainfalls of an inch, or more, have occurred twice since the beginning of observations, but at no other station has more than one such rainfall occurred. The most remarkable fall, both as to actual amount and rate per hour, was that which occurred at Galveston, Tex., November 2, 1873, when 3.50 inches fell in thirty minutes.

Table showing for the month of November monthly rainfalls of 10 inches, or more (in states where monthly rainfalls did not reach 10 inches the station reporting the maximum amount is given); rainfalls of 2.50 inches, or more, in any 24 consecutive hours; and rainfalls equaling or exceeding one inch in one hour.

| States and stations. | Rainfall of 10 inches, or more, per month. | | Rainfall of 2.50 inches, or more, in 24 hours. | | | Rainfall equaling or exceeding one inch per hour. | | | |
|-----------------------|--|-------|--|------|-------|---|--------------|------|-------|
| | Amt. | Year. | Amt. | Day. | Year. | Amt. | Time. | Day. | Year. |
| <i>Alabama.</i> | <i>Inches.</i> | | <i>Inches.</i> | | | <i>Inches.</i> | <i>h. m.</i> | | |
| Florence | 3.31 | 1885 | 6.00 | 6 | 1885 | | | | |
| Greensborough | 2.60 | 1880 | 6.00 | 6 | 1885 | | | | |
| Green Springs | 7.00 | 1885 | 2.50 | 2 | 1885 | | | | |
| Marion | 3.11 | 1885 | 6.00 | 6 | 1885 | | | | |
| Mobile | 2.53 | 1872 | 1.00 | 8 | 1872 | | | | |
| Do | 2.50 | 1876 | 2.50 | 10 | 1876 | | | | |
| Do | 3.40 | 1877 | 2.50 | 20 | 1877 | | | | |
| Do | 4.50 | 1878 | 2.50 | 20 | 1878 | | | | |
| Do | 2.97 | 1881 | 2.50 | 20 | 1881 | | | | |
| Montgomery | 2.65 | 1873 | 1.00 | 1 | 1873 | 1.00 | 1 00 | 2 | 1876 |
| Do | 2.70 | 1885 | | | | | | | |
| Mount Vernon Barracks | 2.75 | 1884 | | | | | | | |
| Summerville | | | | | | | | | |
| <i>Arizona.</i> | 6.16 | 1888 | | | | | | | |
| Fort Mojave | 2.99 | 1888 | | | | | | | |
| Globe | 2.56 | 1888 | 23-24 | | 1888 | | | | |
| <i>Arkansas.</i> | | | | | | | | | |
| Fort Smith | 2.54 | 1883 | 9-10 | | 1883 | | | | |
| Do | 2.86 | 1888 | 7-8 | | 1888 | | | | |
| Helena | 2.55 | 1882 | | | | | | | |
| Do | 4.40 | 1888 | 7-8 | | 1888 | | | | |
| Little Rock | | | | | | | | | |
| Lonoke | 9.65 | 1888 | | | | | | | |
| <i>California.</i> | | | | | | | | | |
| Alcatraz Island | 10.04 | 1885 | | | | | | | |
| Alta | 18.74 | 1875 | | | | | | | |
| Angel Island | 11.57 | 1885 | 2.64 | | 1885 | | | | |
| Ano Nuevo Island | 12.39 | 1875 | | 24 | 1885 | | | | |
| Aptos | 10.65 | 1885 | | | | | | | |
| Auburn | 15.24 | 1885 | | | | | | | |
| Bowman's Dam | 24.96 | 1885 | | | | | | | |
| Cahuenga Valley | 15.67 | 1885 | 2.66 | 19 | 1885 | | | | |
| Callistoga | 11.55 | 1866 | 2.60 | 9 | 1879 | | | | |
| Camp Lincoln | 16.67 | 1865 | | | | | | | |
| Camp Wright | 14.28 | 1874 | | | | | | | |
| Cherokee | 16.99 | 1874 | | | | | | | |
| Cherokee Reservoir | 17.05 | 1885 | | | | | | | |
| Cisco | 15.48 | 1885 | | | | | | | |
| Colfax | 31.93 | 1875 | | | | | | | |
| Crescent City | 12.29 | 1875 | | | | | | | |
| Crystal Springs | 29.38 | 1885 | | | | | | | |
| Delta | 10.47 | 1885 | | | | | | | |
| Dunnigan | 18.69 | 1885 | | | | | | | |
| Emigrant Gap | 11.12 | 1885 | | | | | | | |
| Farallon Islands | 10.91 | 1885 | | | | | | | |
| Folsom | 24.75 | 1865 | | | | | | | |
| Fort Gaston | 24.54 | 1885 | | | | | | | |
| Do | 10.99 | 1865 | | | | | | | |
| Fort Humboldt | 15.35 | 1859 | | | | | | | |
| Fort Ter Waw | 24.12 | 1875 | | | | | | | |
| Georgetown | 11.75 | 1875 | | | | | | | |
| Gilroy | 16.96 | 1875 | | | | | | | |
| Grass Valley | 13.56 | 1875 | | | | | | | |
| Humboldt Light-House | 18.37 | 1885 | | | | | | | |
| Hydesville | 12.80 | 1885 | | | | | | | |
| Jackson | | | | | | | | | |
| Kono Tayee | 15.37 | 1885 | | | | | | | |

Table showing for the month of November, &c.—Continued.

| States and stations. | Rainfall of 10 inches, or more, per month. | | Rainfall of 2.50 inches, or more, in 24 hours. | | | Rainfall equaling or exceeding one inch per hour. | | | |
|------------------------------|--|-------|--|-------|-------|---|-------|------|-------|
| | Amt. | Year. | Amt. | Day. | Year. | Amt. | Time. | Day. | Year. |
| <i>California—Continued.</i> | | | | | | | | | |
| La Grange | 10.58 | 1875 | | | | | | | |
| Laytonville | 18.91 | | | | | | | | |
| Los Angeles | | | 3.41 | 8-9 | 1879 | 1.04 | 0 43 | 9 | 1879 |
| Do. | | | | | | 1.00 | 1 00 | 21 | 1886 |
| Mendocino | 19.14 | 1875 | | | | | | | |
| Middletown | 19.42 | | | | | | | | |
| Nevada City | 21.55 | | | | | | | | |
| North Bloomfield | 20.23 | | | | | | | | |
| Oakland | 11.11 | 1885 | 3.04 | 24 | 1885 | | | | |
| Orleans | 18.82 | | | | | | | | |
| Oroville | 11.27 | 1885 | | | | | | | |
| Petaluma | 11.33 | 1885 | | | | | | | |
| Pilarcitos | 16.94 | 1875 | | | | | | | |
| Placerville | 17.64 | 1875 | | | | | | | |
| Point Arenas | 15.64 | | | | | | | | |
| Point Montara | 10.98 | | | | | | | | |
| Red Bluff | 17.05 | 1885 | 3.83 | 2-3 | 1882 | | | | |
| Do. | 17.22 | 1885 | 5.93 | 8-9 | 1885 | | | | |
| Redding | 13.31 | 1875 | | | | | | | |
| Do. | 11.90 | 1885 | | | | | | | |
| Rosa Valley | 15.96 | | | | | | | | |
| Sacramento | 11.34 | 1885 | 4.29 | 17 | 1885 | | | | |
| San Andreas | 17.30 | 1875 | | | | | | | |
| San Diego | | | 2.68 | 9 | 1879 | | | | |
| San Francisco | 11.78 | 1885 | 3.98 | 23 | 1874 | | | | |
| Do. | | | 2.58 | 24 | 1885 | | | | |
| San Luis Obispo | 12.90 | 1885 | 10.04 | 17-18 | 1885 | | | | |
| San Rafael | 14.23 | 1874 | | | | | | | |
| Do. | 15.24 | 1885 | | | | | | | |
| Santa Cruz | 13.80 | 1875 | | | | | | | |
| Do. | 10.25 | 1885 | | | | | | | |
| Saucelito | 12.05 | | | | | | | | |
| Scott Valley | 11.56 | 1861 | | | | | | | |
| Shingle Springs | 11.16 | 1859 | | | | | | | |
| Suisun City | 10.38 | 1885 | | | | | | | |
| Summit | 13.60 | 1885 | | | | | | | |
| Tehama | 10.42 | 1885 | | | | | | | |
| Towles | 14.40 | 1885 | | | | | | | |
| Ukiah | 19.24 | | | | | | | | |
| Vacaville | 15.98 | 1885 | | | | | | | |
| Weaverville | 16.56 | | | | | | | | |
| Woodside | 11.46 | | | | | | | | |
| <i>Colorado.</i> | | | | | | | | | |
| Pike's Peak | 7.81 | 1878 | 2.91 | 1 | 1881 | | | | |
| Trinidad | | | 2.61 | 7-8 | 1876 | | | | |
| <i>Connecticut.</i> | | | | | | | | | |
| Colebrook | | | 3.60 | 8-9 | 1877 | | | | |
| Fort Trumbull | | | 3.24 | 6-7 | 1872 | | | | |
| Do. | | | 2.60 | 23-24 | 1873 | | | | |
| Mystic | | | 3.20 | 8-9 | 1877 | | | | |
| New Haven | | | 2.93 | 10 | 1875 | | | | |
| New London | | | 3.76 | 6-7 | 1872 | | | | |
| Do. | | | 3.36 | 23-24 | 1873 | | | | |
| Voluntown | 8.39 | 1888 | 3.26 | 10 | 1888 | | | | |
| <i>Dakota.</i> | | | | | | | | | |
| Fort Totten | 5.10 | 1881 | | | | | | | |
| <i>Delaware.</i> | | | | | | | | | |
| Dover | 10.53 | 1876 | 7.58 | 18-20 | 1876 | | | | |
| Do. | | | 3.30 | 24 | 1877 | | | | |
| Fort Delaware | 10.40 | 1868 | 2.90 | 1 | 1868 | | | | |
| Do. | | | 3.00 | 20 | 1868 | | | | |
| <i>District of Columbia.</i> | | | | | | | | | |
| Washington City | 7.18 | 1877 | 2.83 | 24 | 1877 | 1.00 | 1 00 | 24 | 1884 |
| <i>Florida.</i> | | | | | | | | | |
| Archer | | | 4.06 | 9 | 1888 | | | | |
| Cedar Keys | | | 2.89 | 9 | 1888 | | | | |
| Fort Barrancas | 17.79 | 1878 | 4.30 | 20 | 1877 | 1.39 | 1 20 | 11 | 1881 |
| Do. | | | 3.29 | 15 | 1878 | | | | |
| Do. | | | 10.39 | 26 | 1878 | | | | |
| Do. | | | 3.83 | 6 | 1879 | | | | |
| Do. | | | 6.07 | 16 | 1881 | | | | |
| Do. | | | 3.15 | 26 | 1882 | | | | |
| Homeland | | | 3.65 | 9-10 | 1888 | | | | |
| Jacksonville | | | 3.75 | 27-28 | 1884 | | | | |
| Key West | | | 2.54 | 9 | 1884 | | | | |
| Do. | | | 3.51 | 4 | 1884 | | | | |
| Kissimmee City | | | 2.54 | 10 | 1888 | | | | |
| Manatee | | | 4.48 | 9-10 | 1888 | | | | |
| Nama | | | 3.40 | 10 | 1888 | | | | |
| Pensacola | 11.07 | 1885 | 3.54 | 6 | 1881 | | | | |
| Do. | | | 2.69 | 11-12 | 1881 | | | | |
| Do. | | | 3.21 | 23 | 1884 | | | | |
| Do. | | | 2.69 | 5-6 | 1885 | | | | |
| Do. | | | 4.83 | 7-8 | 1885 | | | | |
| Do. | | | 3.08 | 27-28 | 1885 | | | | |
| Punta Rassa | | | 2.70 | 28-29 | 1877 | | | | |
| Saint Mark's | | | 2.70 | 26 | 1878 | | | | |
| Titusville | | | 4.08 | 9-10 | 1888 | | | | |
| <i>Georgia.</i> | | | | | | | | | |
| Atlanta | | | 2.65 | 26-27 | 1878 | | | | |
| Augusta | | | 2.80 | 4 | 1871 | | | | |
| Do. | | | 2.64 | 6-7 | 1873 | | | | |
| Do. | | | 2.70 | 21 | 1877 | | | | |
| Duck | | | 3.60 | 8 | 1886 | | | | |
| Ellerslie | 12.60 | 1880 | | | | | | | |
| Marietta | | | 2.90 | 17 | 1886 | | | | |
| Milledgeville | | | | | | 1.22 | 1 00 | 17 | 1886 |
| Quitman | | | 6.70 | 5-6 | 1880 | | | | |
| Do. | | | 2.50 | 23 | 1881 | | | | |
| Do. | | | 3.00 | 17 | 1886 | | | | |
| Rabun Gap | | | 2.55 | 18-19 | 1878 | | | | |
| Saint Mary's | | | | | | | | | |

Table showing for the month of November, &c.—Continued.

| States and stations. | Rainfall of 10 inches, or more, per month. | | Rainfall of 2.50 inches, or more, in 24 hours. | | | Rainfall equaling or exceeding one inch per hour. | | | |
|----------------------------|--|-------|--|-------|-------|---|--------------|------|-------|
| | Amt. | Year. | Amt. | Day. | Year. | Amt. | Time. | Day. | Year. |
| <i>Idaho.</i> | <i>Inches.</i> | | <i>Inches</i> | | | <i>Inches</i> | <i>h. m.</i> | | |
| Fort Sherman..... | 5.28 | 1885 | | | | | | | |
| <i>Illinois.</i> | | | | | | | | | |
| Anna..... | | | 3.51 | 21 | 1883 | | | | |
| Cairo..... | | | 2.52 | 21-22 | 1874 | | | | |
| Do..... | | | 2.74 | 22-23 | 1875 | | | | |
| Charleston..... | 8.20 | 1881 | 5.21 | 26-27 | 1887 | | | | |
| Champaign..... | | | 2.72 | 18 | 1881 | | | | |
| Chicago..... | | | 3.38 | 11-12 | 1881 | | | | |
| Do..... | | | 3.39 | 5-6 | 1883 | | | | |
| Greenville..... | | | 3.40 | 26 | 1887 | | | | |
| Irishtown..... | | | 2.63 | 27 | 1887 | | | | |
| Jordan's Grove..... | | | 3.25 | 27 | 1887 | | | | |
| Louisville..... | | | 4.25 | 21 | 1883 | | | | |
| Mattoon..... | | | 5.11 | 26 | 1887 | | | | |
| McLeansborough..... | | | 4.24 | 21 | 1883 | | | | |
| Morrison..... | | | 4.08 | 5 | 1883 | | | | |
| Olney..... | | | 2.80 | 8 | 1888 | | | | |
| Oquawka..... | | | 3.00 | 8 | 1888 | | | | |
| Pana..... | | | 3.25 | 26 | 1887 | | | | |
| Peoria..... | | | 3.40 | 27 | 1888 | | | | |
| Rock Island Arsenal..... | | | 4.64 | 16-19 | 1869 | | | | |
| Springfield..... | | | 3.25 | 17-18 | 1881 | | | | |
| Sumner..... | | | 2.60 | 8 | 1888 | | | | |
| Swanwick..... | | | 3.92 | 21 | 1883 | | | | |
| Vandalia..... | | | 5.00 | 26 | 1887 | | | | |
| Do..... | | | 2.65 | 8 | 1888 | | | | |
| Windsor..... | | | 2.73 | 26 | 1887 | | | | |
| <i>Indiana.</i> | | | | | | | | | |
| Arlington..... | | | 3.00 | 14-15 | 1879 | | | | |
| Corydon..... | | | 3.20 | 23 | 1883 | | | | |
| De Gonia..... | | | 2.75 | 21 | 1883 | | | | |
| Delphi..... | | | 2.50 | 8 | 1888 | | | | |
| Evansville..... | 10.05 | 1880 | 3.64 | 21 | 1883 | | | | |
| Do..... | | | 2.70 | 27 | 1878 | | | | |
| Franklin..... | | | 4.25 | 21 | 1883 | | | | |
| Glenwood..... | | | 3.27 | 21 | 1883 | | | | |
| Huntingburg..... | | | 2.75 | 2 | 1888 | | | | |
| Indianapolis..... | | | 4.30 | 17-18 | 1881 | 1.00 | 1 00 | 18 | 1881 |
| Do..... | | | 3.71 | 21 | 1883 | 1.50 | 1 00 | 21 | 1883 |
| Jeffersonville..... | | | 2.68 | 21 | 1883 | | | | |
| Marengo..... | 11.20 | 1888 | 2.76 | 21 | 1883 | | | | |
| Do..... | | | 4.00 | 2 | 1888 | | | | |
| Mitchell..... | | | 2.50 | 21 | 1883 | | | | |
| New Corydon..... | | | 2.65 | 18 | 1881 | | | | |
| Do..... | | | 3.87 | 20 | 1883 | | | | |
| Richmond..... | | | 3.80 | 21 | 1883 | | | | |
| Rising Sun..... | | | 3.25 | 13-14 | 1875 | | | | |
| Rockville..... | | | 2.50 | 9 | 1888 | | | | |
| Saint Meinrad's Abbey..... | | | 2.60 | 26-27 | 1878 | | | | |
| Spiceland..... | | | 2.69 | 21 | 1883 | | | | |
| Vevay..... | | | 3.85 | 22 | 1883 | | | | |
| Worthington..... | | | 3.36 | 21 | 1883 | | | | |
| <i>Indian Territory.</i> | | | | | | | | | |
| Fort Bill..... | | | 2.98 | 19 | 1877 | | | | |
| Fort Towson..... | 9.37 | 1843 | | | | | | | |
| <i>Iowa.</i> | | | | | | | | | |
| Clinton..... | | | 2.65 | 5 | 1883 | | | | |
| Cromwell..... | | | 2.50 | 1 | 1888 | | | | |
| Des Moines..... | 6.49 | 1879 | 2.84 | 11-12 | 1879 | | | | |
| Guttenberg..... | | | 2.60 | 11 | 1879 | | | | |
| Muscatine..... | | | 2.58 | 5 | 1883 | | | | |
| Do..... | | | 2.61 | 2-3 | 1888 | | | | |
| Nashua..... | | | 4.79 | 11 | 1882 | | | | |
| Onawa..... | | | 4.50 | 17 | 1886 | | | | |
| <i>Kansas.</i> | | | | | | | | | |
| Baxter Springs..... | | | | | | 1.10 | 1 00 | 1 | 1876 |
| Fort Larned..... | | | 3.00 | 18 | 1862 | | | | |
| Fort Leavenworth..... | | | 2.66 | 26-27 | 1874 | | | | |
| Holton..... | | | 3.00 | 3 | 1879 | | | | |
| Leavenworth a..... | 7.85 | 1879 | 2.56 | 8 | 1879 | | | | |
| Do..... | | | 2.58 | 11 | 1879 | | | | |
| Do..... | | | 3.10 | 10-11 | 1881 | | | | |
| Leavenworth b..... | | | 2.50 | 16 | 1886 | | | | |
| Waterville..... | | | 2.78 | 11 | 1879 | | | | |
| <i>Kentucky.</i> | | | | | | | | | |
| Bowling Green..... | 7.32 | 1880 | | | | 1.26 | 1 00 | 8 | 1888 |
| Louisville..... | | | 2.57 | 26-27 | 1878 | | | | |
| Do..... | | | 2.91 | 21-22 | 1883 | | | | |
| Paducah..... | | | 2.73? | 13 | 1883 | | | | |
| Do..... | | | 2.87 | 22 | 1883 | | | | |
| <i>Louisiana.</i> | | | | | | | | | |
| Baton Rouge..... | | | 3.10 | 27-28 | 1860 | | | | |
| Do..... | | | 2.75 | 16 | 1874 | | | | |
| Do..... | | | 2.70 | 7 | 1877 | | | | |
| Do..... | | | 2.70 | 20 | 1877 | | | | |
| Lake Charles..... | | | 3.40 | 7-8 | 1888 | | | | |
| New Orleans..... | | | 2.80 | 12-13 | 1871 | | | | |
| Do..... | | | 4.48 | 7-8 | 1872 | | | | |
| Do..... | | | 2.61 | 4-5 | 1873 | | | | |
| Do..... | | | 2.61 | 2 | 1876 | | | | |
| Do..... | | | 2.99 | 6 | 1881 | | | | |
| Do..... | | | 2.57 | 11-12 | 1883 | | | | |
| Okaloosa..... | | | 5.20 | 9 | 1879 | | | | |
| Point Pleasant..... | 20.89 | 1877 | 3.95 | 1 | 1877 | | | | |
| Do..... | 19.52 | 1880 | 6.80 | 8 | 1877 | | | | |
| Do..... | | | 7.10 | 20 | 1877 | | | | |
| Do..... | | | 3.00 | 5-6 | 1880 | | | | |
| Do..... | | | 3.48 | 9 | 1880 | | | | |
| Do..... | | | 3.01 | 24-25 | 1880 | | | | |
| Do..... | | | 6.03 | 11-12 | 1881 | | | | |
| Do..... | | | 3.10 | 6-7 | 1885 | | | | |

Table showing for the month of November, &c.—Continued.

| States and stations. | Rainfall of 10 inches, or more, per month. | | Rainfall of 2.50 inches, or more, in 24 hours. | | Rainfall equaling or exceeding one inch per hour. | | | |
|---------------------------------|--|-------|--|-------|---|---------------|--------------|------|
| | Amt. | Year. | Amt. | Day. | Year. | Amt. | Time. | Day. |
| <i>Louisiana—Continued.</i> | <i>Inches.</i> | | <i>Inches</i> | | | <i>Inches</i> | <i>h. m.</i> | |
| Shreveport..... | | | 4.00 | 22 | 1873 | | | |
| Do..... | | | 2.50 | 8 | 1881 | | | |
| Do..... | | | 4.83 | 10 | 1883 | | | |
| Do..... | | | 3.13 | 22 | 1884 | | | |
| Do..... | | | 2.90 | 24-25 | 1887 | | | |
| <i>Maine.</i> | | | | | | | | |
| Cornish..... | | | 4.08 | 27 | 1877 | | | |
| Gardiner..... | 10.55 | 1845 | | | | | | |
| Mechanic Falls..... | | | 3.47 | 26 | 1877 | | | |
| Orono..... | | | 2.68 | 9 | 1885 | | | |
| Perry..... | 13.00 | 1854 | | | | | | |
| Portland..... | | | 2.69 | 15-16 | 1871 | | | |
| Do..... | | | 2.70 | 24-25 | 1871 | | | |
| Do..... | | | 3.76 | 25-26 | 1877 | | | |
| Do..... | | | 2.65 | 26-27 | 1883 | | | |
| West Waterville..... | | | 3.00 | 27 | 1877 | | | |
| <i>Maryland.</i> | | | | | | | | |
| Baltimore..... | | | 2.85 | 24 | 1877 | | | |
| Emory Grove..... | 13.00 | 1878 | 3.00 | 23 | 1878 | | | |
| Do..... | | | 4.00 | 27 | 1878 | | | |
| Fallston..... | 10.27 | 1877 | 2.60 | 8 | 1877 | | | |
| Mount Saint Mary's College..... | 11.00 | 1881 | 2.67 | 8 | 1877 | | | |
| Do..... | | | 3.78 | 25 | 1877 | | | |
| Do..... | | | 2.94 | 1 | 1881 | | | |
| Do..... | | | 3.80 | 7-8 | 1881 | | | |
| New Market..... | 10.10 | 1877 | 3.78 | 25 | 1877 | | | |
| Sandy Spring..... | | | 5.00 | 23-24 | 1877 | | | |
| Woodstock..... | | | 3.51 | 26 | 1877 | | | |
| <i>Massachusetts.</i> | | | | | | | | |
| Boston..... | 11.63 | 1840 | 3.00 | 15 | 1871 | | | |
| Do..... | 10.25 | 1845 | 3.45 | 17-18 | 1873 | | | |
| Do..... | 10.03 | 1876 | 5.43 | 20-21 | 1876 | | | |
| Do..... | | | 2.93 | 25-26 | 1877 | | | |
| Do..... | | | 3.09 | 18 | 1878 | | | |
| Fall River..... | 10.73 | 1888 | 3.00 | 9 | 1877 | | | |
| Fort Independence..... | | | 3.00 | 20 | 1874 | | | |
| Do..... | | | 5.25 | 21-22 | 1874 | | | |
| Long Plain..... | 11.47 | 1888 | | | | | | |
| Mansfield..... | 10.18 | 1888 | | | | | | |
| Middleborough..... | 10.23 | 1888 | | | | | | |
| Milton..... | | | 3.07 | 20 | 1885 | | | |
| Do..... | | | 6.20 | 25-27 | 1888 | | | |
| New Bedford..... | | | 2.98 | 26 | 1877 | | | |
| Princeton..... | | | 2.63 | 9 | 1885 | | | |
| Taunton..... | | | 2.50 | 10 | 1888 | | | |
| Thatcher's Island..... | 11.18 | 1881 | 2.88 | 7 | 1876 | | | |
| Do..... | | | 3.08 | 26 | 1877 | | | |
| Do..... | | | 5.75 | 18-19 | 1878 | | | |
| Do..... | | | 3.14 | 18 | 1879 | | | |
| Do..... | | | 3.91 | 19 | 1881 | | | |
| Wood's Holl..... | 11.70 | 1876 | 2.50 | 7 | 1876 | | | |
| <i>Michigan.</i> | | | | | | | | |
| Litchfield..... | | | 2.50 | 11-12 | 1881 | 1.02 | 1 00 | 27 |
| Mottville..... | | | | | | | | 1887 |
| Niles..... | | | 2.67 | 11 | 1881 | | | |
| Northport..... | 14.00 | 1882 | 2.90 | 18 | 1879 | | | |
| Do..... | | | 3.30 | 10-11 | 1882 | | | |
| Do..... | | | 5.25 | 24-25 | 1884 | | | |
| Traverse City..... | | | 4.02 | 11 | 1882 | | | |
| <i>Minnesota.</i> | | | | | | | | |
| Saint Paul..... | 2.93 | 1880 | | | | | | |
| <i>Mississippi.</i> | | | | | | | | |
| Biloxi..... | | | 3.25 | 9 | 1887 | | | |
| Brookhaven..... | | | 3.60 | 25-26 | 1878 | | | |
| Do..... | | | 2.60 | 11-12 | 1879 | | | |
| Fayette..... | 10.60 | 1880 | 5.60 | 27-28 | 1880 | | | |
| Natchez..... | | | 3.06 | 16 | 1869 | 3.06 | 2 00 | 16 |
| Starkville..... | | | 2.55 | 27 | 1882 | | | 1869 |
| Vicksburg..... | 14.15 | 1880 | 2.50 | 1 | 1877 | | | |
| Do..... | 11.53 | 1883 | 2.83 | 7-8 | 1877 | 1.82 | 0 20 | 15 |
| Do..... | | | 3.18 | 24-25 | 1880 | 1.81 | 1 20 | 28 |
| Do..... | | | 2.93 | 28 | 1880 | | | |
| Do..... | | | 2.81 | 30 | 1880 | | | |
| Do..... | | | 3.72 | 11 | 1881 | | | |
| Do..... | | | 4.79 | 10-11 | 1883 | | | |
| Do..... | | | 4.02 | 22 | 1883 | | | |
| <i>Missouri.</i> | | | | | | | | |
| Boonville..... | | | 3.10 | 18 | 1881 | | | |
| Hermann..... | | | 2.70 | 18 | 1881 | | | |
| Lexington..... | | | 2.66 | 1 | 1876 | | | |
| Saint Louis..... | | | 3.00 | 7 | 1847 | | | |
| Do..... | | | 3.32 | 27 | 1840 | | | |
| Do..... | | | 3.35 | 16 | 1869 | | | |
| Do..... | | | 2.99 | 17-18 | 1881 | | | |
| Do..... | | | 2.81 | 8-9 | 1882 | | | |
| Springfield..... | | | 2.51 | 26 | 1887 | | | |
| Savannah..... | 8.90 | 1878 | | | | | | |
| <i>Montana.</i> | | | | | | | | |
| Fort Assinaboine..... | 3.76 | 1883 | | | | | | |
| <i>Nebraska.</i> | | | | | | | | |
| Lincoln..... | 4.25 | 1881 | | | | | | |
| Omaha..... | 4.25 | 1879 | | | | | | |
| Plattsmouth..... | | | | | | 1.00 | 1 00 | 7 |
| <i>Nevada.</i> | | | | | | | | 1874 |
| Carson City..... | 7.01 | 1875 | | | | | | |
| <i>New Hampshire.</i> | | | | | | | | |
| Auburn..... | 11.20 | 1877 | 3.25 | 17 | 1878 | | | |
| Do..... | | | 4.00 | 22 | 1878 | | | |
| Mount Washington..... | | | 4.74 | 9 | 1877 | | | |
| Do..... | 17.55 | 1877 | 2.81 | 8 | 1881 | | | |
| Do..... | 15.10 | 1881 | 3.35 | 23-24 | 1884 | | | |

Table showing for the month of November, &c.—Continued.

| States and stations. | Rainfall of 10 inches, or more, per month. | | Rainfall of 2.50 inches, or more, in 24 hours. | | | Rainfall equaling or exceeding one inch per hour. | | | |
|------------------------|--|-------|--|-------|-------|---|--------------|------|-------|
| | Amt. | Year. | Amt. | Day. | Year. | Amt. | Time. | Day. | Year. |
| <i>New Jersey.</i> | | | | | | | | | |
| Atlantic City | <i>Inches.</i> | | <i>Inches</i> | | | <i>Inches</i> | <i>h. m.</i> | | |
| Do. | | | 3.09 | 24 | 1877 | | | | |
| Barneget City | 8.71 | 1877 | 3.70 | 8-9 | 1885 | | | | |
| Do. | | | 2.83 | 20 | 1876 | | | | |
| Lambertville | | | 5.33 | 24-25 | 1877 | | | | |
| Do. | | | 3.10 | 3 | 1860 | | | | |
| Sandy Hook | | | 3.65 | 2-3 | 1861 | | | | |
| Do. | | | 2.75 | 22 | 1878 | | | | |
| <i>New Mexico.</i> | | | | | | | | | |
| Fort Selden | 8.13 | 1888 | 7.75 | 24-26 | 1888 | | | | |
| <i>New York.</i> | | | | | | | | | |
| Buffalo | | | 2.53 | 14-15 | 1871 | | | | |
| Fort Columbus | | | 3.00 | 2-3 | 1861 | | | | |
| Fort Wood | | | 2.60 | 2-3 | 1861 | | | | |
| Hess Road Station | | | 2.60 | 10 | 1888 | | | | |
| Madison Barracks | | | 2.52 | 10 | 1888 | | | | |
| Moriches | | | 2.74 | 10 | 1875 | | | | |
| New York City | | | 2.83 | 6-7 | 1872 | 1.10 | 1 05 | 10 | 1888 |
| Setauket | | | 3.80 | 1-2 | 1885 | | | | |
| West Point | | | 2.50 | 1-2 | 1885 | | | | |
| White Plains | 9.80 | 1878 | 3.90 | 27 | 1878 | | | | |
| <i>North Carolina.</i> | | | | | | | | | |
| Cape Lookout | 12.23 | 1877 | | | | | | | |
| Charlotte | | | 2.75 | 28 | 1884 | | | | |
| Elsworth | 13.50 | 1880 | 3.50 | 10 | 1880 | | | | |
| Do. | | | 5.00 | 28 | 1880 | | | | |
| Fayetteville | | | 4.25 | 27 | 1878 | | | | |
| Flat Rock | | | 3.12 | 18 | 1886 | | | | |
| Hatteras | 12.68 | 1880 | 3.10 | 15 | 1880 | 1.00 | 1 00 | 24 | 1877 |
| Do. | 13.02 | 1884 | 2.99 | 28 | 1882 | | | | |
| Do. | | | 3.12 | 26 | 1883 | | | | |
| Do. | | | 3.80 | 16 | 1884 | | | | |
| Highlands | | | 4.00 | 26 | 1878 | | | | |
| Do. | | | 2.50 | 7 | 1881 | | | | |
| Do. | | | 3.10 | 9 | 1881 | | | | |
| Kitty Hawk | | | 2.67 | 7-8 | 1875 | | | | |
| Do. | | | 2.66 | 19 | 1879 | | | | |
| Do. | | | 2.60 | 14-15 | 1880 | | | | |
| Do. | | | 2.87 | 28 | 1882 | | | | |
| Do. | | | 4.04 | 16 | 1884 | | | | |
| Lenoir | | | 3.80 | 25 | 1886 | | | | |
| Portsmouth | | | 2.78 | 28 | 1882 | | | | |
| Raleigh | | | 4.52 | 1 | 1887 | | | | |
| Reidsville | | | 5.00 | 7-8 | 1885 | | | | |
| Southport | | | 2.90 | 22 | 1877 | | | | |
| Statesville | | | 4.50 | 23 | 1877 | | | | |
| Do. | | | 2.79 | 25 | 1886 | | | | |
| Wilmington | | | 2.78 | 14-15 | 1888 | 1.10 | 1 00 | 14 | 1888 |
| <i>Ohio.</i> | | | | | | | | | |
| College Hill | | | 2.50 | 14 | 1875 | | | | |
| Do. | | | 2.50 | 19 | 1881 | | | | |
| Columbus | | | 2.95 | 18-19 | 1881 | | | | |
| Portsmouth | | | 3.20 | 23 | 1835 | | | | |
| Do. | | | 2.90 | 26 | 1836 | | | | |
| Do. | | | 3.38 | 1 | 1846 | | | | |
| Toledo | | | 2.68 | 13-14 | 1871 | | | | |
| West Milton | 9.52 | 1888 | | | | | | | |
| <i>Oregon.</i> | | | | | | | | | |
| Astoria | 19.12 | 1869 | 3.00 | 29 | 1875 | | | | |
| Do. | 13.00 | 1874 | | | | | | | |
| Do. | 10.70 | 1875 | | | | | | | |
| Do. | 12.45 | 1885 | | | | | | | |
| Do. | 10.45 | 1888 | | | | | | | |
| Bandon | 18.21 | 1885 | | | | | | | |
| Block House | 16.20 | 1859 | | | | | | | |
| Eola | 13.01 | 1877 | 2.63 | 21 | 1877 | | | | |
| Fort Hoskins | 18.10 | 1861 | | | | | | | |
| Fort Stevens | 22.21 | 1877 | | | | | | | |
| Fort Umpqua | 18.05 | 1861 | | | | | | | |
| Fort Yamhill | 16.27 | 1865 | | | | | | | |
| Portland | 10.22 | 1874 | 2.60 | 23 | 1874 | | | | |
| Do. | 15.77 | 1875 | 3.62 | 26-27 | 1883 | | | | |
| Do. | 10.03 | 1876 | 3.10 | 7 | 1885 | | | | |
| Do. | 12.45 | 1877 | | | | | | | |
| Port Orford | 14.18 | 1855 | | | | | | | |
| Roseburg | | | 3.58 | 6-7 | 1885 | | | | |
| Yaquina Light-House | | | 2.63 | 8 | 1887 | | | | |
| <i>Pennsylvania.</i> | | | | | | | | | |
| Carlisle | | | 3.00 | 8 | 1877 | | | | |
| Do. | | | 3.20 | 24 | 1877 | | | | |
| Greencastle | | | 2.57 | 8 | 1877 | | | | |
| Philadelphia | | | 2.59 | 19-20 | 1876 | | | | |
| Tarentum | | | 3.00 | 23 | 1875 | | | | |
| Wellsborough | | | 5.50 | 23 | 1884 | | | | |
| Do. | | | 3.65 | 17-18 | 1886 | | | | |
| Do. | | | 2.60 | 23 | 1886 | | | | |
| York | 9.50 | 1886 | 3.00 | 26 | 1886 | | | | |
| Zionsville | | | | | | 1.01 | 0 40 | 18 | 1886 |
| <i>Rhode Island.</i> | | | | | | | | | |
| Newport | | | 3.16 | 10 | 1875 | | | | |
| Do. | | | 2.91 | 7 | 1876 | | | | |
| Do. | | | 2.97 | 18 | 1878 | | | | |
| Kingston | 9.57 | 1888 | | | | | | | |
| <i>South Carolina.</i> | | | | | | | | | |
| Aiken | | | 3.48 | 25 | 1883 | | | | |
| Charleston | | | 4.17 | 8 | 1877 | | | | |
| Do. | | | 3.58 | 18-19 | 1879 | | | | |
| Do. | | | 3.92 | 14 | 1888 | | | | |
| Conway | 7.50 | 1888 | | | | | | | |
| <i>Tennessee.</i> | | | | | | | | | |
| Andersonville | | | 3.00 | 7 | 1885 | | | | |
| Bolivar | | | 3.67 | 21 | 1886 | | | | |

Table showing for the month of November, &c.—Continued.

| States and stations. | Rainfall of 10 inches, or more, per month. | | Rainfall of 2.50 inches, or more, in 24 hours. | | | Rainfall equaling or exceeding one inch per hour. | | | |
|-----------------------------|--|-------|--|-------|-------|---|--------------|------|-------|
| | Amt. | Year. | Amt. | Day. | Year. | Amt. | Time. | Day. | Year. |
| <i>Tennessee—Continued.</i> | <i>Inches.</i> | | <i>Inches.</i> | | | <i>Inches.</i> | <i>h. m.</i> | | |
| Beech Grove | | | 2.65 | 17 | 1886 | | | | |
| Caryville | | | 3.12 | 7 | 1885 | | | | |
| Chattanooga | | | 3.08 | 30 | 1880 | 1.80 | 1 38 | 8 | 1888 |
| Do. | | | 3.00 | 22 | 1883 | | | | |
| Do. | | | 2.82 | 6-7 | 1885 | | | | |
| Do. | | | 2.74 | 8 | 1888 | | | | |
| Covington | | | 3.96 | 21 | 1885 | | | | |
| Farmingdale | | | 3.17 | 7 | 1885 | | | | |
| Do. | | | 3.37 | 17 | 1886 | | | | |
| Fostoria | | | 2.70 | 21 | 1886 | | | | |
| Grief | | | 3.28 | 7 | 1885 | | | | |
| Johnsonville | | | 2.98 | 11 | 1886 | | | | |
| Knoxville | | | 2.55 | 16-17 | 1873 | 1.05 | 0 55 | 30 | 1880 |
| Do. | | | 2.54 | 22-23 | 1874 | | | | |
| Do. | | | 2.79 | 25-26 | 1878 | | | | |
| Do. | | | 2.65 | 22-23 | 1883 | | | | |
| Do. | | | 3.14 | 6-7 | 1885 | | | | |
| Manchester | | | 3.60 | 17 | 1886 | | | | |
| Memphis | 9.63 | 1875 | 2.54 | 3-4 | 1875 | 1.00 | 1 00 | 11 | 1886 |
| Do. | | | 3.24 | 21-22 | 1888 | | | | |
| Do. | | | 2.64 | 6-7 | 1888 | | | | |
| Ridgely | | | 2.87 | 17 | 1886 | | | | |
| Do. | | | 2.65 | 22 | 1886 | | | | |
| Woodstock | | | 3.15 | 21 | 1886 | | | | |
| <i>Texas.</i> | | | | | | | | | |
| Austin | | | 2.89 | 9-10 | 1866 | | | | |
| Do. | | | 2.64 | 12-13 | 1870 | | | | |
| Do. | | | 3.50 | 15-16 | 1874 | | | | |
| Do. | | | 3.40 | 18-19 | 1874 | | | | |
| Do. | | | 4.20 | 26 | 1875 | | | | |
| Belmont Farm | 13.00 | 1873 | 2.70 | 1 | 1874 | | | | |
| Do. | 12.00 | 1877 | 7.00 | 1 | 1877 | | | | |
| Do. | | | 4.00 | 17 | 1877 | | | | |
| Bluff Settlement | 10.00 | 1874 | 8.00 | 14-16 | 1874 | | | | |
| Brownsville | | | 2.60 | 13 | 1882 | 1.98 | 1 23 | 18 | 1888 |
| Clarksville | 13.00 | 1873 | | | 1884 | | | | |
| Cleburne | | | 2.75 | 22 | 1888 | | | | |
| Corpus Christi | | | 4.59 | 7 | 1888 | 1.52 | 1 15 | 7 | 1888 |
| Corsicana | | | 3.62 | 23-24 | 1887 | 2.00 | 2 00 | 26 | 1887 |
| Fort Brown | | | 4.30 | 12-13 | 1874 | | | | |
| Galveston | | | 2.67 | 12-13 | 1872 | 3.50 | 0 30 | 2 | 1873 |
| Do. | | | 5.63 | 6 | 1872 | 1.48 | 0 15 | 5 | 1877 |
| Do. | | | 4.06 | 2-3 | 1873 | | | | |
| Do. | | | 2.53 | 19 | 1884 | | | | |
| Do. | | | 2.51 | 22 | 1884 | | | | |
| Do. | | | 3.58 | 7-8 | 1888 | | | | |
| Gilmer | 10.67 | 1860 | | | 1877 | | | | |
| Indianola | | | 2.95 | 5 | 1877 | | | | |
| Do. | | | 3.16 | 17 | 1878 | | | | |
| Mason | | | 3.26 | 9 | 1878 | | | | |
| New Ulm | 14.92 | 1873 | 2.75 | 22 | 1884 | | | | |

Table showing for the month of November, &c.—Continued.

| States and stations. | Rainfall of 10 inches, or more, per month. | | Rainfall of 2.50 inches, or more, in 24 hours. | | | Rainfall equaling or exceeding one inch per hour. | | | |
|-------------------------|--|-------|--|-------|-------|---|-------------------|------|-------|
| | Amt. | Year. | Amt. | Day. | Year. | Amt. | Time. | Day. | Year. |
| <i>Texas—Continued.</i> | <i>Inches.</i> | | <i>Inches.</i> | | | <i>Inches.</i> | <i>h. m.</i> | | |
| Palestine | | | 2.95 | 25-26 | 1882 | 2.18 | 0 50 | 10 | 1883 |
| Do. | | | 5.05 | 10 | 1883 | | | | |
| Do. | | | 2.51 | 3-4 | 1885 | | | | |
| Rio Grande City | | | | | | 1.02 | 0 55 | 16 | 1878 |
| San Antonio | | | | | | 1.30 | 1 00 | 27 | 1887 |
| Do. | | | | | | 1.05 | 1 00 | 7 | 1888 |
| Silver Falls | | | 3.74 | 13-14 | 1888 | | | | |
| <i>Utah.</i> | | | | | | | | | |
| Salt Lake City | 5.81 | 1875 | | | | | | | |
| <i>Vermont.</i> | | | | | | | | | |
| Newport | 7.80 | 1886 | | | | | | | |
| Post Mill Village | | | 2.80 | 17 | 1886 | | | | |
| <i>Virginia.</i> | | | | | | | | | |
| Boonsborough | | | 4.50 | 24 | 1877 | | | | |
| Cape Henry | | | 2.81 | 23 | 1881 | | | | |
| Lynchburgh | 9.65 | 1877 | 4.23 | 22 | 1877 | | | | |
| Mount Solon | | | 4.65 | 24 | 1877 | | | | |
| Norfolk | | | | | | 1.14 | ($\frac{1}{2}$) | 10 | 1888 |
| <i>Washington.</i> | | | | | | | | | |
| Cathlamet | 13.20 | 1874 | | | | | | | |
| Do. | 13.00 | 1875 | | | | | | | |
| Fort Canby | 19.07 | 1866 | 2.70 | 19-20 | 1888 | | | | |
| Do. | 13.72 | 1885 | | | | | | | |
| Fort Cascades | 12.95 | 1860 | | | | | | | |
| Fort Vancouver | 11.57 | 1853 | | | | | | | |
| Neah Bay | 27.60 | 1865 | | | | | | | |
| Do. | 17.86 | 1878 | | | | | | | |
| Do. | 19.60 | 1885 | | | | | | | |
| Do. | 11.80 | 1886 | | | | | | | |
| Do. | 11.20 | 1888 | | | | | | | |
| Olympia | 19.88 | 1877 | 3.24 | 15-16 | 1878 | | | | |
| Do. | 11.09 | 1878 | | | | | | | |
| Do. | 10.18 | 1885 | | | | | | | |
| Pysh | 13.07 | 1885 | 2.63 | 13 | 1885 | | | | |
| Tatoosh Island | 20.70 | 1869 | 3.58 | 28 | 1883 | | | | |
| Do. | 15.83 | 1883 | 4.13 | 29 | 1883 | | | | |
| Do. | 19.25 | 1885 | 2.97 | 27-28 | 1886 | | | | |
| Do. | 10.44 | 1886 | | | | | | | |
| Do. | 10.15 | 1887 | | | | | | | |
| Do. | 10.76 | 1888 | | | | | | | |
| <i>West Virginia.</i> | | | | | | | | | |
| Helvetia | 7.98 | 1878 | | | | | | | |
| <i>Wisconsin.</i> | | | | | | | | | |
| Bloomfield | | | 2.50 | 10-11 | 1879 | | | | |
| Cadiz | | | 3.60 | 1-2 | 1888 | | | | |
| Manitowoc | 10.11 | 1882 | | | | | | | |
| <i>Wyoming.</i> | | | | | | | | | |
| Fort Laramie | 3.23 | 1886 | | | | | | | |

* No date given. † Railroad records. ‡ Signal Service records. § Less than 1 hour.

WINDS.

The most frequent directions of the wind during November, 1888, are shown on chart ii, by arrows flying with the wind. On the Atlantic coast, south of the fortieth parallel, and along the Gulf coast northerly winds prevailed. In New England, the lake region, the Mississippi and Missouri valleys, the middle and southeastern Rocky Mountain slopes, and in the middle and southern plateau regions they were variable. In the northern plateau region southwest winds predominated, while on the immediate Pacific coast they were from northeast to northwest over southern California, west at San Francisco, north at Eureka, Cal., and south to east in Washington Territory.

HIGH WINDS (in miles per hour).

Maximum velocities of fifty miles, or more, per hour, other than those given in the table of miscellaneous meteorological data, have been reported as follows: Eastport, Me., 53, ne., 25th; Hatteras, N. C., 58, n., 24th, 52, n., 26th; Block Island, R. I., 82, ne., 25th, 52, ne., 27th.

LOCAL STORMS.

1st. Iowa.—Iowa City: The most noticeable storm of the month occurred on this date. The temperature of the day was 22° above the normal, corresponding to the normal temperature of the first week of September. A light thunder-storm with little rain extended over Iowa in the morning, and was followed by a much more intense one in the evening. In the

valley of the Iowa and Cedar rivers this storm was most intense, and a straight blow traveled down this valley from 7 p. m. to 10 p. m., accompanied with heavy rain and lightning. The rain increased from about one-half inch in southern Mitchell county to nearly three inches at Iowa City. The wind was most severe between Waterloo and Vinton, destroying considerable town and farm property at La Porte City and Mount Auburn. It was not a tornado or cyclone but a straight blow. Hail and heavy rain fell only in connection with this storm just below the region of greatest intensity of the wind. —Report of Iowa Weather Service.

2d. Illinois.—Mattoon, Coles Co.: during a thunder-storm, hail of unusual size fell. **Missouri.**—Kansas City: a thunder-storm moving from southwest to northeast began 1.15 a. m. and ended 3.15 a. m. The thunder was very loud, and the lightning almost continuous. Maximum velocity of wind 30 miles per hour, from the southwest.

7th. Texas.—Abilene: a tornado was observed west of this station at 7.40 p. m., and disappeared 7.50 p. m. It was first observed twenty miles west of station. The track was through a sparsely settled section, and no serious damage was caused. In the afternoon a heavy thunder-storm, moving from west to east, occurred to the northwest of the station, continuing from 4.43 p. m. to 7.50 p. m. Light rain fell at this place from 7.15 p. m. to 7.48 p. m., during which time a very heavy rain was falling about two miles to the northwestward. An interesting